T /9/2,4,7,10,11

3/9/2 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

TP1. J91 Biotech

04462236 E.I. No: EIP96083272900
Title: Mass transfer and biochemical reaction in immobilized cell packed bed reactors: correlation of experiment with theory
Author: Nath, Sunil; Chand, Subhash
Corporate Source: Indian Inst of Technology, New Delhi, India
Source: Journal of Chemical Technology and Biotechnology v 66 n 3 July 1996 p 286-292
Publication Year: 1996
CODEN: JCTBED ISSN: 0268-2575
Language: English
Document Type: JA; (Journal Article) Treatment: A; (Applications); X; (Experimental)
Journal Announcement: 9610W1
Abstract: A quantitative analysis of mass transfer combined with biochemical reaction and correlation of experiment with theory is carried out for immobilized cell packed bed reactors for the first time. Experimental data on flow rates and pseudo first-order rate constants, k//p//s, for the continuous bioconversion of sugars to ethanol in an immobilized cell reactor using Saccharomyces cerevisiae cells on activated bagasse chips has been analyzed and compared with theory. Theoretically, first-order reaction kinetics was considered and various external film diffusion models of the type j//D equals K Re** minus **(**1** minus **n**) evaluated. The effects of external film diffusion in immobilized cell reactors have been quantified. Various mass transfer correlations were systematically tested and the mass transfer correlation j//D equals 5.7 Re** minus **0**.**5**9 correctly predicted experimental data. Use of this correlation is recommended to quantify external film diffusion effects for the continuous bioconversion of sugars to ethanol in immobilized cell packed bed reactors. Finally, the mass transfer coefficient, k//m, was calculated as a function of the mass velocity, G, and the Reynolds number, Re. This study will be of use in making realistic engineering estimates of the effect of external mass transfer on the observed reaction rates in immobilized cell bioreactors. (Author abstract) 17 Refs.
Descriptors: *Bioreactors; Mass transfer; Biochemistry; Chemical reactions; Packed beds; Reaction kinetics; Bioconversion; Sugars; Yeast; Cells
Identifiers: Immobilized cell packed bed reactors; Pseudo first order rate constants; Immobilized cells; External film diffusion; Mass transfer coefficient; Saccharomyces cerevisiae
Classification Codes:
802.1 (Chemical Plants & Equipment); 461.8 (Biotechnology); 641.3 (Mass Transfer); 801.2 (Biochemistry); 802.3 (Chemical Operations)
802 (Chemical Apparatus & Plants); 461 (Biotechnology); 641 (Heat & Thermodynamics); 801 (Chemical Analysis & Physical Chemistry)
80 (CHEMICAL ENGINEERING); 46 (BIOENGINEERING); 64 (HEAT & THERMODYNAMICS)

3/9/4 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

ordered!

05001102 Genuine Article#: UY318 Number of References: 28
Title: IMMOBILIZATION OF SACCHAROMYCES-DIASTATICUS ON WOOD CHIPS FOR ETHANOL-PRODUCTION
Author(s): RAZMOVSKI R; PEJIN D
Corporate Source: UNIV NOVI SAD,FAC TECHNOL/YU-21000 NOVI SAD//YUGOSLAVIA/
Journal: FOLIA MICROBIOLOGICA, 1996, V41, N2, P201-207

ISSN: 0015-5632
Language: ENGLISH Document Type: ARTICLE
Geographic Location: YUGOSLAVIA
Subfile: SciSearch; CC LIFE--Current Contents, Life Sciences; CC AGRI--
Current Contents, Agriculture, Biology & Environmental Sciences
Journal Subject Category: BIOTECHNOLOGY & APPLIED MICROBIOLOGY
Abstract: Saccharomyces diastaticus cells were immobilized onto beech wood chips of different particle size and three pH values. pH values in the range 5.0-6.0, and 1.84-1.92 mm particle size had a positive effect on the immobilization process. The chosen carrier -1.84 mm-sized wood chips adsorbed 150 mg dry cell mass per g dry carrier mass. The Gibbs free energy and the activation energy for the first (monolayer) and second (multilayer) immobilization stages was 4581, 19090 and 8590 J g mol(-1), respectively The kinetics of immobilized cell systems in ethanol production have been studied in a packed bed-reactor. Ethanol production and the respiration quotient (RQ) were at a maximum at a dilution rate of 0.16/h. The reactor was operated under steady-state conditions for 30 d at the dilution rate 0.16/h.
Identifiers--KeyWords Plus: CELL TECHNOLOGY; YEAST; GLUCOSE; FERMENTATION; CEREVISIAE; SYSTEMS; ALCOHOL; BATCH; PERFORMANCE; STRAINS
Cited References:
AMIN G, 1985, V22, P237, APPL MICROBIOL BIOT
BANERJEE M, 1988, V32, P831, BIOTECHNOL BIOENG
BARBEL HR, 1990, V33, P54, APPL MICROBIOL BIOT
CALLEJA GB, 1982, V4, P534, BIOTECHNOL LETT
CHEN C, 1990, V36, P975, BIOTECHNOL BIOENG
CHEN C, 1990, V36, P993, BIOTECHNOL BIOENG
DALE MC, 1990, V36, P983, BIOTECHNOL BIOENG
DEBNATH S, 1990, V25, P43, PROCESS BIOCHEM
DEKKERS JGJ, 1981, V23, P1023, BIOTECHNOL BIOENG
DIVIES C, 1994, V14, P135, CRIT REV BIOTECHNOL
DUVNJAK Z, 1982, V24, P2297, BIOTECHNOL BIOENG
DUVNJAK Z, 1981, P175, P 6 INT FERM S LOND
FRELOT D, 1982, V4, P705, BIOTECHNOL LETT
GHOSE TK, 1979, V21, P1387, BIOTECHNOL BIOENG
LALUCE C, 1984, V48, P17, APPL ENVIRON MICROB
LAMPTEY L, 1981, P630, P 2 WOLD C CHEM ENG
LAPLACE JM, 1993, V39, P760, APPL MICROBIOL BIOT
LAPLACE JM, 1993, V28, P519, PROCESS BIOCHEM
LARSSON PO, 1979, V1, P501, BIOTECHNOL LETT
LODDER J, 1970, P619, YEAT TAXONOMIC STUDY
MASSCHELEIN CA, 1994, V14, P155, CRIT REV BIOTECHNOL
MILLER GL, 1959, V31, P426, ANAL CHEM
MOOYOUNG M, 1980, V2, P541, BIOTECHNOL LETT
PEJIN D, 1993, V38, P141, FOLIA MICROBIOL
SATTERFIELD CN, 1970, P63, MASS TRANSFER HETERO
SMITH MJ, 1975, P291, INTRO CHEM ENG THERM
TYAGI RD, 1992, V27, P23, PROCESS BIOCHEM
UMBRETT WW, 1972, P86, MANOMETRIC BIOCH TEC

3/9/7 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal

14957543 PASCAL No.: 01-0110058
Novel primary fermentation with immobilized yeast
PAJUNEN Esko; LOMMI H; VIJAVA T
Oy Sinebrychoff Ab, Finland; GEA Liquid Processing Scandinavia A/S, Denmark; Danisco Suaar and Sweetners Development, Finland
World Brewing Congress (Orlando, Florida USA) 2000
Journal: Technical quarterly - Master Brewers Association of the Americas, 2000, 37 (4) 483-488
ISSN: 0743-9407 CODEN: TQMBAC Availability: INIST-21245; 354000093831270110

order ctl

No. of Refs.: 6 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: United States
Language: English Summary Language: Spanish

Beer of good organoleptic quality has been fermented in a simple single-reactor system in large pilot scale with yeast immobilised on a fixed bed of wood chips. The bed volume was 1000 L and ! production rate 50 litres/hour. The time needed for fermentation has been 20-30 hours only. The system has been running continuously for several weeks. Beer flavour can be controlled by fermentation parameters. The system is economically attractive. Major savings in capital investments compared with conventional fermentation arise from smaller equipment volume and space required. Further savings come from smaller losses due to reduced yeast growth and practically no tank bottoms. Furthermore, the cleaning costs are smaller because of continuous operation and reduced equipment volume. There is additional saving potential in CO SUB 2 recovery cooling and waste management, which are more difficult to quantify. In spite of some extra costs attributable to increased pumping in the system, the net economical balance is clearly in favour of the new process. The system can be scaled up in modular design to increase flexility in varing capacity needs. The process is designed to be integrated with continuous maturation, thus providing all the benefits of a truly continuous process.

English Descriptors: Beer; Alcoholic fermentation; Brewer yeast; Immobilization; Continuous system; Pilot plant scale
Broad Descriptors: Alcoholic beverage; Boisson alcoolisee; Bebida alcoholica

French Descriptors: Biere; Fermentation alcoolique; Levure brasserie; Immobilisation; Systeme continu; Echelle pilote

Classification Codes: 002A35C04; 002A35D; 002A31C09A; 215

3/9/10 (Item 4 from file: 144)
DIALOG(R)File 144:Pascal

04872905 PASCAL No.: 83-0119534

Comparative study of ethanol production by an immobilized yeast in a tubular reactor and in a multistage reactor

(Etude comparative de la production d'ethanol par une levure immobilisee dans un reacteur tubulaire et dans un reacteur multietage)

RYU Y W; NAVARRO J M; DURAND G
ERA-CNRS no 879, inst. national sci. appliquees, Toulouse 31077, France
Journal: Eur. j. appl. microbiol. biotechnol., 1982, 15 (1) 1-8
ISSN: 0171-1741 Availability: CNRS-16771
No. of Refs.: 13 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: Federal Republic of Germany
Language: English

QR53.E9
Gf.1

Etude comparative de la conversion de glucose en ethanol par Saccharomyces cerevisiae souche STV 89 immobilise sur des copeaux de bois dans un reacteur tubulaire et dans un reacteur multietage
The productivity of continuous ethanol fermentation has been increased using fixed bed reactors where a high density of yeast cells was maintained on a packing of wood chips. Two different systems have been used: 1. A tubular reactor which produced alcohol solutions containing up to 13.5% (V/V) ethanol. High CO SUB 2 retention and a poor mass transfer between bulk medium and immobilized biomass prevented production rates higher than 2.2 g/l.h. 2. A multistage reactor where a better utilisation of the reactor volume led to improved performances. Solutions containing 132 g/l

of ethanol (16.5% V/V) were produced with a productivity increased up to 4.8 g/l.h. A better distribution of the active biomass and a lower gradient of alcohol concentration between support and bulk medium are possible reasons for this improvement

English Descriptors: Comparative study; Ethanol; Production; Yeast; Immobilization; Tube in shell reactor; Multistage apparatus; Natural energy; Biomass; Glucose; Saccharomyces cerevisiae; Conversion; Fermentation; Reactor; Comparative study; Bioreactor; Experimental study; France

French Descriptors: Etude comparative; Ethanol; Production; Levure; Immobilisation; Reacteur tubulaire; Appareil etage; Energie naturelle; Biomasse; Glucose; Saccharomyces cerevisiae; Conversion; Fermentation; Reacteur; Etude comparative; Bioreacteur; Etude experimentale; France

Classification Codes: 215D03A; 340A04H; 730C06

3/9/11 (Item 1 from file: 240)
DIALOG(R)File 240:PAPERCHEM

order ed

00240896 PAPERCHEM NO: AB5800805
Integrated Bioreactor-Separator [Permits] in situ Recovery of Fermentation Products by a Novel Membrane-Based Dispersion-Free Solvent Extraction Technique
Frank, G. T.; Sirkar, K. K
SOURCE: Biotechnol. Bioeng. Symp. no. 17/Symp. Biotechnol. for Fuels & Chemicals (Gatlinburg) 8th: 303-316 (May 13-16, 1986). [Engl.]
PUBLICATION YEAR: 1986
DOCUMENT TYPE: CONFERENCE LITERATURE
LANGUAGES: ENGLISH
A locally integrated bioreactor-separator was used for the recovery of biomass fermentation products. The tubular apparatus contains numerous axially located microporous hydrophobic hollow-fiber membranes evenly distributed among immobilized biocatalyst particles. Nutrients are supplied to the biocatalyst as in an immobilized-cell tubular reactor. The substrate flows through the shell side space which is packed with wood chips. A solvent, dibutyl phthalate, flows through the hollow-fiber lumina and continuously extracts the products produced locally in the fermentor using a recently developed dispersion-free solvent extraction technique. Carbon dioxide is also removed continuously throughout the length of the fibers, ensuring greater reactor stability. The hollow fibers are also used to supply oxygen throughout the reactor while removing carbon dioxide. Production of ethanol by yeast fermentation is considered, and data are presented. (8 fig., 18 ref., 1 tab.)
DESCRIPTORS: ALCOHOLS; BIOMASS; BYPR; CHEMICAL REACTIONS; ENGLISH; ETHANOL; EXTRACTION; FERMENTATION; HOLLOW SYNTHETIC FIBERS; MEMBRANES; NUTRIENTS; PLANTS; REACTORS; SEPARATION; SEPARATORS; SYNTHETIC FIBERS; YEASTS
FILE SEGMENT: AB (IPST Abstract Bulletin non-patents)
?